

The Research of Chinese Life Insurance Companies' Operating Performance

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Abstract: The study of operating efficiency of life insurance companies has been the focus of many scholars, and the two main research methods are subjective empowerment and objective empowerment at present. To address this issue and also to combine the operational characteristics of life insurance companies in China. This article establishes a relative and objective comprehensive evaluation index system and uses factor analysis to study the operational efficiency of life insurance companies in China. Twenty-six life insurance companies with two complete operating cycles in the Chinese life insurance market as of 2020 were selected as the research sample. Thirteen indicators were selected to construct a cross-sectional data system to evaluate the operational efficiency of life insurance companies. The results show that Chinese life insurance companies are comparable to joint venture life insurance companies in terms of overall score, business capacity and profitability, with a relatively even distribution of rankings; while joint venture companies generally lag behind Chinese companies in terms of company size and strength and solvency.

Keywords: Life insurance companies, Factor analysis, Business performance.

1. Introduction

As modern people attach more and more importance to life insurance, the comprehensive evaluation related to life insurance companies has become increasingly important. Life insurance companies are of great significance to the financial sector and even the Chinese economy. Up to now, relevant government departments have issued more than 40 industry normative documents as well as regulations, including an instruction from the CBRC for such companies ("Guidance from the General Office of the China Banking and Insurance Regulatory Commission on Promoting the Specialized, Refined and Intensive Development of Property and Casualty Insurance" CBRC Office of the Office of the CBRC [2021] No. 1029). We could see that the evaluation of life insurance companies is particularly important. However, for governments and regulators, there is no single standard in the market to objectively evaluate the performance of life insurance companies and their capabilities. The existing methods of evaluation are mostly subjective and empowering, and are easily influenced by personal emotions and experiences, resulting in subjective judgments. Wu Wangchun (2020) studied the difference in operational efficiency between Chinese and foreign life insurance companies[1];Zhou SiJuan (2021) analyzed the static efficiency of 14 life insurance companies using DEA

model[2]; Yang Shu'e (2014) and Liu Lu (2012) also have studies and conclusions on both past Chinese life insurance companies[3] [4]. This article updates the studies and conclusions of other scholars by selecting data from recent years based on historical literature. This paper adopts the factor analysis method, which is more recognized by the public, to analyze the input and expenditure capacity, profitability, and payout capacity of Chinese life insurance companies through historical data to objectively and comprehensively evaluate the performance of the selected companies.

2. Sample Selection and Index System Construction

2.1. Sample selection

In this paper, 26 life insurance companies that have been in complete operation for more than 2 years as of 2020 are selected. These are divided into 18 Chinese companies and 8 Sino-foreign joint venture companies. This paper evaluates the performance of these life insurance companies by grouping them. All data in the sample are cross-sectional as of 2020 and are derived from the balance sheet, income statement, and business statistics in the China Insurance Yearbook (2020). The sample of life insurance companies is as follows.

Table 1. Breakdown of Chinese and Sino-foreign joint venture companies

Chinese companies		Sino-foreign joint venture companies
Taikang Life Insurance Co.	Huatai Life Insurance Co.	Manulife-Sinochem Life
Prudential Life Insurance Co.	Ji Xiang Life Insurance Co.	Allianz China Life Insurance Co.
Pacific Life Insurance Co.	Tianan Life Insurance Co.	Assicurazioni Generali
Ping An Insurance Company of China.	Evergrande Life Insurance Co.	Zhong Ying Life Insurance Company
Shin Tai Life Insurance Co.	Minsheng Life Insurance Co.	China United Metropolitan Life Insurance Co.
Hopewell Life Insurance Co.	Everbright Sun Life Insurance Co.	Sino-Dutch Life Insurance Co.
Taiping Life Insurance Co.	Li An Life Insurance Co.	China Korea Life Insurance Co.
ChinaUnited Life Insurance Co.	Guohua Life Insurance Co.	Anglo Pacific Life Insurance Co.
China People's Life Insurance Co.	China Life Insurance Co.	

2.2. Construction of the indicator system

This article intends to objectively assess the comprehensive performance of the selected sample of life insurance companies through factor analysis. Thus, the indicators are selected through the regulatory authorities as well as the market to establish the input and expenditure capacity, profitability and payout capacity of major life insurance companies. Considering the adoptability of relevant data and the objective judgment of indicators, the indicators evaluated in this paper are as follows: premium business income x1, investment return rate x2, life insurance liability reserve x3, surrender rate x4, claim expense rate x5, policy dividend expense rate x6, operating income x7, operating profit growth rate x8, life insurance liability reserve ratio x9, fixed asset ratio x10, employee compensation payment ratio x11, time deposit ratio x12, total assets x13; 13 items in total. [5]

3. Research Method

3.1. Introduction to Factor Analysis

Factor analysis is a mature method of data analysis, often used to analyze high-dimensional data. The method examines correlations among indicators or factors in order to find representative indicators or factors hidden within them. Factor analysis can also identify observable latent variables, as well as unobservable dummy variables, within the existing data structure. In addition, the factor analysis method splits the variables under study into multiple factors and combines the factors with common factors and analyzes each factor and variable by observing the influence of the common factors on the subcomponents. The performance of life insurance companies requires multiple dimensions for comprehensive judgment, and the factor analysis method can be used to determine the various capabilities of each company by

digging deeper through the correlation of indicators.

3.2. Test of Hypothesis

Before the formal factor analysis calculation, the KMO test and Bartlett's sphericity test are needed to determine whether the collected data meet the criteria of factor analysis. Both tests examine the correlation between variables, with the KMO test coefficient ranging from 0 to 1, the larger the value the greater the correlation between the variables. When the value is greater than 0.5 then factor analysis can be applied. Factor analysis can be performed when the p-value is less than 0.05 in the Bartlett test. The SPSS software was used to test the 13 indicators of the above 22 companies, and after filtering and removing some of the research items with too high correlation, the final KMO was 0.548 and Bartlett's sphericity was 0.00. The comprehensive judgment was that the data could be used for factor analysis.

3.3. Steps of Factor Analysis

(1) Eigenvalue, Variance Explained Rate, Cumulative Rate

We calculated the data from the collected sample companies by entering them into the SPSS program. A matrix of the number of relationships of the standardized variables was created to derive the eigenvalues, variance explained and cumulative rates. The tables are analyzed for factor extraction, and the amount of information extracted from the factors. From the table, we can see that the factor analysis extracted 4 factors with the eigenroot values greater than 1. The variance explained by the rotation of these 4 factors are 33.322%, 19.553%, 13.724%, and 13.566% respectively, and the cumulative variance explained by the rotation is 80.166%, which means that these 4 factors can analyze 80.166% of the information of several indicators. The four factors were named as F1, F2, F3, F4.

Table 2. Variance Explained Rate

Eigenvalue			Variance Explained Rate Before Rotation			Variance Explained Rate After Rotation		
Eigenvalue	Variance Explained Rate %	Cumulative Rate%	Eigenvalue	Variance Explained Rate %	Cumulative Rate%	Eigenvalue	Variance Explained Rate %	Cumulative Rate%
1	4.083	40.830	4.083	40.830	40.830	3.332	33.322	33.322
2	1.476	14.758	1.476	14.758	55.588	1.955	19.553	52.875
3	1.332	13.319	1.332	13.319	68.908	1.372	13.724	66.600
4	1.126	11.258	1.126	11.258	80.166	1.357	13.566	80.166
5	0.961	9.609			89.166			
6	0.454	4.536			89.755			
7	0.412	4.123			94.311			
8	0.155	1.546			98.434			
9	0.002	0.020			99.999			
10	0.000	0.001			100.000			

(2) Create the rotated factor loading matrix

We used the four common factors mentioned above to establish the loading matrix, and the detailed data are shown in the table below. From the table below, we can see that: all the research items correspond to a common degree value higher than 0.4, which means that there is a strong correlation between the research items and the factors, and the factors can extract the information effectively.

From the table, we can see that factor F1 is concentrated in premium business income, operating income, and total assets, and is highly correlated. These four indicators are linked to the business capability of the company. So, we name this

public factor as: business capability.

Public factor F2 has high factor loadings in investment return, benefit expense ratio and policy dividend expense ratio. These indicators reflect the profitability and earning power of the company therefore naming this factor: profitability.

The public factor F3 has high loadings in term deposit ratio and life insurance liability reserve ratio. These indicators can show the capital reserve of a life insurance company and the size of the company. Therefore, this factor is named: Company Size and Strength.

The last factor, F4, has a high loading in the surrender rate

and fixed assets ratio. These indicators indicate some aspects of the company's expenses and payout capacity, so named solvency.

Table 3. Factor Loading Form

Name	Factor 1	Factor 2	Factor 3	Factor 4	Commonality
Premium business income	0.979	0.162	0.016	-0.015	0.985
Investment return rate	0.248	0.812	-0.333	-0.010	0.831
Surrender rate	-0.091	0.017	-0.144	0.726	0.556
Claims expense ratio	0.314	0.783	0.326	0.278	0.895
Policy Dividend Expense Ratio	0.080	0.720	0.339	-0.407	0.806
Operating income	0.979	0.163	0.011	-0.015	0.986
Fixed Assets Ratio	0.034	-0.039	0.216	0.723	0.572
Time deposit ratio	0.530	0.283	0.480	-0.238	0.648
Life Insurance Liability Reserve Ratio	-0.015	0.026	0.862	0.081	0.750
Total assets	0.979	0.171	0.012	-0.021	0.988

Table 4. Component Score Coefficient Matrix

Name	Coefficient 1	Coefficient 2	Coefficient 3	Coefficient 4
Premium business income	0.334	-0.101	-0.044	0.016
Investment return rate	-0.066	0.530	-0.373	0.042
Surrender rate	-0.019	0.090	-0.110	0.541
Claims expense ratio	-0.053	0.427	0.139	0.257
Policy Dividend Expense Ratio	-0.141	0.395	0.165	-0.262
Operating income	0.334	-0.100	-0.048	0.016
Fixed Assets Ratio	0.027	-0.021	0.171	0.538
Time deposit ratio	0.119	0.000	0.315	-0.152
Life Insurance Liability Reserve Ratio	-0.041	-0.087	0.664	0.062
Total assets	0.332	-0.095	-0.048	0.012

Table 5. Life Insurance Company Component Score

Company Name	Score	F1	F2	F3	F4
China Life Insurance Co.	1.8766	0.3517	0.7325	0.2857	3.902
Ping An Life Insurance Co.	0.713	-0.7078	-1.104	0.0381	2.4359
Pacific Life Insurance Co.	0.6837	-0.4146	0.9606	1.3782	0.6093
Sino-Dutch Life Insurance Co.	0.6302	1.2912	2.2258	1.2408	-0.6543
People's Life Insurance Co.	0.4761	2.4728	-0.3779	0.5379	-0.0213
Sino-Italian Life Insurance Co.	0.2458	0.7377	0.3184	1.6413	-0.8031
Taiping Life Insurance Co.	0.2352	-0.6711	1.2659	0.3178	0.1312
Taikang Life Insurance Co.	0.0952	-0.2108	-1.3112	1.4563	0.0002
Ji Xiang Life Insurance Co.	0.0592	1.0237	-0.7376	0.5984	-0.3217
Hopewell Life Insurance Co.	-0.0296	0.3937	-0.7548	0.8885	-0.442
Sino-German Allianz Insurance Co.	-0.0566	-1.6272	1.7802	0.1335	-0.2851
China Korea Life Insurance Co.	-0.0639	1.538	0.018	-1.1516	-0.1115
Tianan Life Insurance Co.	-0.0835	1.6877	0.4629	-1.7861	-0.0305
Minsheng Life Insurance Co.	-0.1121	-0.795	-0.7383	1.7249	-0.6541
Everbright Sun Life Insurance Co.	-0.1977	0.4654	-0.5018	-0.3278	-0.266
Huatai Life Insurance Co.	-0.2707	-0.8871	0.3198	0.3707	-0.6392
Leasehold Life Insurance Co.	-0.273	-0.0733	0.9887	-1.2342	-0.3099
Guohua Life Insurance Co.	-0.286	0.3549	-0.9698	-0.4447	-0.1722
Sino-US Union Pacific Insurance Co.	-0.3538	-0.7185	0.7012	-0.5303	-0.5363
CITIC Life Insurance Co.	-0.3912	-0.6669	0.6712	-1.6639	0.0304
Chung Ying Life Insurance Co.	-0.3979	-0.0276	-0.6366	-0.5337	-0.3706
China Hong Life Insurance Co.	-0.4315	-1.1685	0.6472	-0.5196	-0.5241
China United Insurance Co.	-0.4469	0.2028	-0.3725	-1.257	-0.2666
CITIC Prudential Insurance Co.	-0.4538	-0.9278	-0.7709	-0.2907	-0.2258
Evergrande Life Insurance Co.	-0.5713	-0.8572	-1.5099	-0.4383	-0.1464
Yingda Taihe Insurance Co.	-0.5957	-0.766	-1.3068	-0.4342	-0.3282

Note: The results were calculated by author using SPSS19.

(3) Weighting and Composite Score

The scores of the four common factors were calculated by

weighting the matrix of component score coefficients as shown below. The composite scores of the 26 sample life

insurance companies were then calculated from the scores and ranked in positive order.

4. Analysis of Empirical Results

4.1. Performance Comparison by Life Insurance Companies

In the table above, the composite score as well as the factor scores of each life insurance company have been ranked. The analysis of these 26 companies corresponding to the information related to overall capacity, business capacity, profitability, solvency and company size and strength is as follows.

First, Comprehensive capability. Comprehensive ability is a neutral criterion for the other four abilities and measures the balanced development of a company. As you can see from the table, China Life Insurance Company is the only life insurance company with a score above 1, and the score is much higher than the second ranked Ping An Life Insurance Company. The companies with strong comprehensive strength are China Life Insurance Company, Ping An Life Insurance Company, Pacific Life Insurance Company, China Dutch Life Insurance Company, and People's Life Insurance Company. The weaker companies are China Grand Life Insurance Company, China United Insurance Company, CITIC Prudential Insurance Company, Evergrande Life Insurance Company, and Yingda Taihe Insurance Company. As you can see, the life insurance companies with strong overall strength are those that have been established in China for a long time and have a certain reputation and scale.

Second, business capacity. Business capacity is an assessment of a life insurance company's ability to sell its insurance. Business capacity is often tied to profitability, with the more insurance sold the more profitable it is. Looking at this capability alone, those with better business capability are People's Life Insurance Company, Tianan Life Insurance Company, China-Korea Life Insurance Company, Sino-Dutch Life Insurance Company, and China-German Allianz Insurance Company. At the bottom of the list in terms of business capabilities are Evergrande Life Insurance Company, Huatai Life Insurance Company, CITIC Prudential Insurance Company, China Macro Life Insurance Company, and Sino-German Allianz Insurance Company. These companies need to refine their insurance sales a bit.

Third, profitability. All companies aim to make money, and the company's profitability determines the company's development prospects. From the table, we can see that the companies with excellent profitability are Sino-Dutch Life Insurance Company, Sino-German Allianz Insurance Company, Taiping Life Insurance Company, Leander Life Insurance Company, and Pacific Life Insurance Company. Profitability corresponds to indicators calculated in percentages, and these companies are more prominent in terms of earnings as well as profits. The less profitable companies are: Guohua Life Insurance Company, Ping An Life Insurance Company, Yingda Taihe Insurance Company, Taikang Life Insurance Company, and Evergrande Life Insurance Company.

Fourth, company size and strength. Among these 26 sample companies, those with large and strong companies include: Minsheng Life Insurance Company, China-Italy Life Insurance Company, Taikang Life Insurance Company, Pacific Life Insurance Company, and Sino-Hollywood Life Insurance Company. However, the smaller and weaker

companies include China-Korea Life Insurance Company, Leigh & Orange Life Insurance Company, China United Insurance Company, Shin Tai Life Insurance Company, and Tianan Life Insurance Company. This shows that the largest and strongest companies are those that are well established and have some influence in the Chinese life insurance market.

Fifth, Solvency. The solvency of an insurance company is fundamental to the company's long-term presence in the market. Among the 26 sample companies, those with better solvency are: China Life Insurance Company, Ping An Life Insurance Company, Pacific Life Insurance Company, Taiping Life Insurance Company, and CITIC Life Insurance Company. Those with relatively poor solvency are: China United Insurance Company, Huatai Life Insurance Company, Minsheng Life Insurance Company, Sino Dutch Life Insurance Company, and Sino Italian Life Insurance Company.

4.2. Comparison of Chinese and Joint Venture Life Insurance Companies

The overall mean data shows that the performance of Chinese companies is not comparable to that of joint ventures. In the composite score, the distribution of Chinese companies is more evenly distributed with that of joint ventures. This is also reflected in Business Capability F1 and Profitability F2. However, in other aspects, the ranking of JVs is basically distributed in the middle and lower segments in terms of company size and strength F3 and solvency F4. This leads to the conclusion that joint ventures are generally slightly inferior to Chinese companies in terms of company size and strength and solvency.

In summary, we can see that as the economy develops and the insurance market gradually matures, consumer demand for life insurance gradually increases or decreases, and competition in the life insurance market is bound to become more intense. As one of the important pillars of the financial industry, the development of the country's economy requires the entire life insurance industry to work together and play an important role as a social stabilizer. As a life insurance company itself, the continuous development of better life insurance products to meet the increasingly diverse needs of consumers, reduce operating costs and improve its own operational efficiency is also a necessary step to be able to compete in the fierce market in the future.

5. Conclusion

In this article, we collected data from 26 life insurance companies with more than 2 years of complete operation as of 2020, including 18 Chinese companies and 8 Sino-foreign joint venture companies. We then constructed a data system to objectively analyze the comprehensive strength and performance of these 26 companies from multiple perspectives. Factor analysis was used to refine the public factors of each data, and the four aspects of business capacity, profitability, solvency, and company size and strength were used to rate the weights of these 26 companies. The scoring results and conclusions are as follows: the companies with strong overall strength are China Life Insurance Company, Ping An Life Insurance Company, Pacific Life Insurance Company, China Dutch Life Insurance Company, and People's Life Insurance Company. Among them, China Life Insurance Company has the highest rating, far ahead of Ping An Life Insurance Company, which ranks second; companies

with dominant business capabilities are: People's Life Insurance Company, Tian An Life Insurance Company, China-Korea Life Insurance Company, China-Dutch Life Insurance Company, and China-German Allianz Insurance Company; companies with outstanding profitability are: China-Dutch Life Insurance Company, China-German Allianz Insurance Company, Taiping Life Insurance Company, Leigh & Orange Life Insurance Company, and Pacific Life Insurance Company. The companies with strong solvency are: Minsheng Life Insurance Company, Zhong Yi Life Insurance Company, Taikang Life Insurance Company, Pacific Life Insurance Company, and Sino-Dutch Life Insurance Company; the companies with large and strong scale are China Life Insurance Company, Ping An Life Insurance Company, Pacific Life Insurance Company, Taiping Life Insurance Company, and Shin Tai Life Insurance Company. These are all life insurance companies with a certain reputation in China.

On top of this it is also seen that there are still shortcomings of each life insurance company behind the overall comprehensive ranking: although Chinese life insurance companies are ranked as a whole, with relatively good scale strength, profitability and solvency, it is necessary to focus on growth potential and the improvement of capital utilization efficiency [6]. Although foreign life insurance companies have a relatively low overall comprehensive ranking and are slightly deficient in terms of scale strength and profitability, their growth potential and capital utilization efficiency are relatively good. At the same time, according to the different

corporate development stages and external environments of different life insurance companies, they also need to have to formulate targeted development strategies to cope with their corporate shortcomings and thus improve their operational efficiency, which needs to be further studied.

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